

JUNIOR HIGH
AGRICULTURE/LAND AND LIFE PROGRAM
CURRICULUM GUIDE

1987

FIELD TEST DRAFT

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FIELD TEST DRAFT

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Note: the resources listed in this guide have not been authorized and have been listed for evaluation purposes only.

Where possible suggested sources for these materials have been identified.



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PREFACE

As a field test curriculum guide, the program outlined within this document is in draft form.

The document is made available to teachers, administrators, curriculum specialists and others primarily for review and evaluation purposes. Where approval has been obtained at the local board level, this guide may serve as the basis for planning and teaching a junior high agriculture program. Such approval will apply to the 1987-1988 school year. A revised program is expected to be available for use in the fall of 1988.

Teachers, administrators and curriculum specialists who are forwarded copies of this guide will be asked to participate in the review process. A questionnaire will be provided for recording reactions and observations, and regional meetings may be convened to provide opportunity for oral feedback.

Any questions, comments and reactions regarding this guide should be brought to the attention of:

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PROGRAM RATIONALE

The junior high Agriculture/Land and Life program is designed to provide students a broad awareness of the economic, social and scientific realities of the agricultural enterprise. It provides students an opportunity to explore personal interests as well as to broaden their understandings of the world in which they live.

The program is designed to be of interest to all students in the province, whether they be of urban or rural backgrounds. Examples and emphasis within the program provide for a balance of perspectives, including those of the consumer and the city gardener as well as the worker in agricultural businesses. The emphasis of the program is thus on awareness, insights and understanding of agriculture rather than on specific vocational knowledge and skills.

PROGRAM GOALS

Students will:

1. Develop an awareness of the diversity of agricultural activity in their local area, in Alberta, and in the international community.
2. Develop critical thinking and problem solving skills in the process of examining agricultural problems and practises.
3. Acquire knowledge of the factors of agricultural production and processing.
4. Recognize relationships between producers, processors, marketers and consumers.
5. Appreciate agriculture for its economic significance, career opportunities and its impact on quality of life.
6. Acquire knowledge and develop skills applicable to plant and animal care in both urban and rural settings.
7. Develop a resource management perspective, recognizing areas where personal and public decision making are needed.
8. Acquire an awareness of agricultural technologies, including examination of emerging technologies as well as those of the past and present.
9. Develop an awareness of societal issues and concerns that are agriculture related.
10. Develop an awareness of the scope of agriculture in urban areas.

PROGRAM ORGANIZATION

The organization of the Agriculture/Land and Life program reflects the need to provide students a broad view of agriculture as well as provide opportunities for pursuing local needs and interests.

Specific guidelines for program organization are as follows:

1. Year One, Year Two, Year Three Format

The program content is organized in a way that provides for topics and themes to be developed over a three year program sequence. Entry points to the program may be at any of the three levels, but where possible it is recommended that students enter the sequence at the year one level.

For students entering the program at the year two or three level, it is recommended that the unit What is Agriculture: An Overview be included as part of their first year in the program.

2. Key Themes

In each year of the program, three theme based units are to be included. The three required themes are:

- Production, Processing and Marketing
- Agricultural Technology and Research
- Resource Management

Flexibility is provided in the selection of particular topics to develop the themes. To provide guidance in selecting and organizing content, an example has been developed for each theme at each level.

Instructional requirements for theme based units are defined by the learning objectives, which are listed in the form of concepts, skill and attitude statements. These objectives are mandatory whereas the selection of specific content to achieve the objectives is a matter of school and student choice.

3. Options

The balance of the program is based on optional units which may be selected from the list provided. At each level of the program a student may also study an additional local interest topic that has not been identified on this list.

4. Planning the Year's Program

Four to seven units will normally constitute a year's work. Each unit will normally represent 10 to 15 hours of student activity. A total of 75 instructional hours is recommended for each level of the program, but exact times may be adapted to suit the overall instructional plan of the individual school.

5. Case Study Approach

Within the required themes, the approach to topic development is generally through a case study. Using this approach, students have the opportunity to learn important ideas and principles through a focus on a meaningful example.

FIELD TEST DRAFT PROGRAM SCOPE AND SEQUENCE

THEME	YEAR 1	YEAR 2	YEAR 3
Theme 1 <i>Production, Processing, and Marketing</i>	Case Study of Production, Processing and Marketing Emphasis on consumer perspective Example topic: Milk products	Case Study of Production, Processing and Marketing Emphasis on nutrition Example topic: Meat Products	Case Study of Production, Processing and Marketing Emphasis on energy Example topic: Field Crops: Food and Forage
	What is Agriculture: An Overview	Optional Unit *	Optional Unit *
Theme 2 <i>Technology and Research</i>	Mechanical Technology Case Study Example topic: Grain Technology	Technology for Planning, Monitoring and Managing Case Study Example topic: Green house Management	Biotechnology Case Study Example topic: Large Animal Production
	Optional Unit *	Optional Unit *	Optional Unit *
Theme 3 <i>Resource Management</i>	Water	Soil	Land Use
	Optional Unit *	Optional Unit *	Optional Unit *

* See list of recommended optional topics on following page.

RECOMMENDED OPTIONAL TOPICS

Agriculture and Human History	Indoor Gardening
Agricultural Horizons: An Examination of Agriculture Around the World	Irrigation
Agricultural Services	Landscape and Trees
Animal Care	Marketing and Advertising
Bee Keeping	Market Gardening
Cattle	Marketing Systems
Computers and Agriculture	Mushroom Farming
Crop Protection	Oilseed (Canola)
Farming and Wildlife	Planning and Finances: the Business Side of Farming
Forage Crop Production	Poultry
Fruit Crops	Processing and Preserving
Fur Farming	Research and Technologies
Hogs	Sheep and Goats
Home Gardening and Food Production	Sugar
Import and Exports	Transportation
Horses	Trapping
	Tree Farming
	Weather and Crop Management

YEAR ONE PROGRAM

What is Agriculture?: An Overview of the Agriculture Industry

Overview

This unit is a required unit within the year one program only. The intent of this unit is to provide a comprehensive overview of agricultural activity, providing students a sense of its diversity and scope. The perspective adopted within this unit is that agricultural activity involves much more than the rural farm and that the impact of agriculture pervades all of society. The unit examines agriculture at a variety of levels from local to global and introduces students to Alberta's role as both an importer and an exporter of agricultural commodities.

The unit is recommended to follow the Theme 1 unit; many of the key ideas and skills can be drawn out of learnings from this case study.

Objectives

Concepts

- diversity of agricultural operations
- components of agricultural industries: production, processing and marketing
- roles and careers
- agriculture as both producer and consumer of services
- historical trends:
 - increasing productivity per farmer
 - increasing productivity per unit area of land
 - degradation of farmland in areas of long term inappropriate land use practises
- local, provincial, national and international food production
- transportation and trade of food products

Skills

- classification and sequencing of steps in the production, processing, marketing and distribution of agricultural products
- interpretation of maps and charts
- identification of factors which support or inhibit food production in different areas of the world
- analyzing issues in global agricultural production

Attitudes

- appreciation of the complex food production, processing and distribution system that exists to meet all our local food needs
- awareness of the diversity of agriculture related activities and occupations
- appreciation of international nature of food production
- concern regarding problems in worldwide food production

Topic Outline	Student Activities	Resources
<p>1. Diversity of agricultural operations (both urban and rural)</p> <ul style="list-style-type: none"> - processing - production - marketing and distributing <p>2. Agriculture as both producer and consumer of community services</p> <p>3. Personal/social perspective</p> <ul style="list-style-type: none"> - consumer - worker - producer - careers <p>4. Variation in global production and consumption patterns</p>	<p>Students:</p> <ul style="list-style-type: none"> view film and/or video to survey Alberta agricultural activity collect and classify newspaper articles related to agriculture <ul style="list-style-type: none"> - news items - advertisements for agricultural products - classified advertisements - business section items identify major food processing operations identify local and Alberta agricultural products <ul style="list-style-type: none"> - farm products - processed products read and discuss community services that support farm operations <ul style="list-style-type: none"> - in local area - in province - in Canada list agriculture related careers compare current agricultural practises in Canada to those of 50 and 100 years ago compare Canadian agricultural production methods with those of other countries discuss what is considered food in different parts of the world identify imported agricultural products discuss why these products are imported rather than produced locally 	

Note: The right hand column has been left blank in this field test draft. Teachers are asked to note references that have been found particularly useful. (See appendix 1 for a listing of related resources)

YEAR 1: WHAT IS AGRICULTURE? AN OVERVIEW OF THE AGRICULTURE INDUSTRY

Topic Outline	Student Activities	Resources
<p>4. continued</p> <p>5. Alberta's role in food production</p> <ul style="list-style-type: none"> - Alberta operations - Alberta and Canada - Canada and the world 	<p>Students:</p> <p>view and discuss information regarding Alberta farm production of various foods, comparison with production of these foods in other countries and other areas</p> <p>prepare a pot luck lunch featuring Alberta products and/or foods from other cultures</p> <p>identify areas in which local, Alberta and Canadian expertise in food production is being shared worldwide</p> <p>view, read and discuss information on world trade in food</p> <p>identify transportation links by which trade takes place: routes and means of transportation</p> <p>read, view and discuss issues in world agricultural production</p>	

THEME 1: Production Processing and Marketing

Overview

This unit follows a case study approach. The intent of the unit is to provide a practical study of production, processing and marketing through the direct study of a particular agriculture industry. The dairy industry has been used to illustrate the development of the case study but the approach followed here may be adapted to any other agriculture related industry. Emphasis is to be placed on consumer perspective, i.e., food needs and preferences and their influence on the agriculture industry. In keeping with a consumer perspective, it is suggested that the unit be approached first by examining local food products in relation to consumer needs and preferences. The stages leading up to the final product can then be traced in relation to this initial perspective on the industry.

Opportunities are provided within the unit for students to become involved in activities that are realistic examples of activities within agricultural industries. In particular, students will have opportunities to take initiatives in the design and development of consumer surveys, in the preparation of a sample product and in the design of a sample marketing strategy.

Objectives

Concepts

- consumption
- consumer needs and preferences
- products
- merchandising
- processing and packaging
- production (farm operations)
- transportation and storage
- career specializations and expertise
- local production as a component of provincial and national and international production

Skills

- monitoring personal consumption
- assessing consumer needs and preferences
- classifying products
- identifying steps in processing and packaging
- examining role of consumer preferences in determining products and packaging
- designing and evaluating approaches to marketing

Attitudes

- awareness of the complex and multifaceted nature of an agricultural production industry
- appreciation of the consumer - producer relationship
- appreciation of the role of technologies in agricultural production, processing and marketing
- awareness and appreciation of opportunities for careers in agriculture related industry

Example Topic: Milk Products

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1. Focus on milk products 2. Monitoring personal consumption 3. Needs and preferences 4. Merchandising and packaging of food 	<p>Students:</p> <ul style="list-style-type: none"> sample dairy products examine the range of dairy products, identifying characteristics and uses of the various products monitor and record personal and family consumption of milk products; construct charts and graphs of the results estimate the quantity of milk products consumed in a year: (1) by individuals at different age levels and (2) by a community of people, such as the community made up of the families of all members of the class identify differences in the amounts of milk products used by different age groups, and also their preferences for different groups of milk products discuss and identify characteristics of different forms of milk products that have appeal for different consumers examine advertisements for milk products and identify the appeal to the consumer discuss the significance of dairy products for nutrition: identify proportions of daily nutritional needs that are met by milk products examine packaging: sizes, forms, labeling and visual layout of packages prepare a hypothetical marketing strategy for a new line of dairy products: discuss the nature of the product, who the consumers would be; also design the packaging and a series of advertisements focus on one or two products such as cheese and yogurt: examine the steps in production of these products 	

Topic Outline
<p>5. Local production and processing</p> <p>6. Transportation and storage</p> <p>7. Specializations and expertise</p> <p>8. Provincial and national perspective</p>

Student Activities
<p>Students:</p> <p>examine print and visual materials to learn the steps in dairy processing</p> <p>visit a dairy or dairy product processing facility</p> <p>examine the essentials of a dairy farm operation, i.e.: livestock selection and management, grazing operations, feed production and preparations, milking operations and sanitary and health considerations</p> <p>where possible, visit a dairy farm</p> <p>construct a network or flow chart that illustrates the stages of production, processing and marketing of a particular dairy product</p> <p>identify materials and services that are required to support a dairy operation, i.e., workforce and expertise; feed, food supplements and medicines; land, structures and equipment; energy and transportation</p> <p>construct a network chart that illustrates the interrelationship of dairy industry related occupations</p> <p>examine print or visual materials that show the production and consumption of dairy products at the provincial, national and international levels</p> <p>identify major patterns of trade in dairy products at local, provincial, national and international levels</p>

Resources
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THEME 2: Technology and Research: Mechanical Technologies

Overview

In this case study, students consider practical problems which have faced farmers since the earliest times: how to plant, harvest and mill grain; and to do these things in a way which is both efficient and effective. The development of techniques and specialized equipment are presented as a form of problem solving where the need for the technology exists first, then the inventions and new techniques follow. Students are presented with the problems, then consider both their own ideas and the technologies that have been specifically developed to solve these problems. By tracing the historical development of agricultural equipment, students are able to understand and appreciate the significance of improvements through the years.

Note that although grain technology has been used as an example for this case study, the objectives for the unit can be achieved through the study of any food production or processing industry.

Objectives

Concepts

- physical work inherent in agriculture
- specific tasks to be performed in producing a particular agricultural product (tasks and subtasks)
- power sources: manual, animal, fuels, electrical sources
- manual and mechanical approaches to production
- technology as problem solving (finding effective and efficient ways to get a job done)
- effectiveness of technologies
- efficiency of technologies
 - efficiency in use of human time and energy
 - efficiency in use of land
 - efficiency in use of other resources
- safety of technologies
- alternate technologies

Skills

- analysis skills in identifying sequences of tasks to be performed
- creative thinking skills in identifying alternate approaches to solving a practical problem
- drawing and designing skills in making drawings of devices to perform given tasks
- construction skills in building models of equipment

Attitudes

- appreciation of the human energy and expertise that go into agricultural production
- awareness of human progress in applying technology to agricultural production
- awareness of self as a problem solver
- awareness of the effect of agricultural technology on the overall quality of life
- awareness and appreciation of opportunities for careers in agriculture related industry

Example Topic: Grain Production and Processing Technology

Topic Outline
<ol style="list-style-type: none"> 1. Manual work and mechanization 2. Technology as problem solving 3. Examining specific examples of locally used technology (may be farm based or based on processing of farm products)

Student Activities
<p>Students:</p> <ul style="list-style-type: none"> separate grain from a head of wheat by hand dissection learn basic nomenclature regarding grain types and parts of grain plants discuss alternate technologies to separate grain use early technologies to separate grain, i.e., flailing and winnowing (in schoolyard using sticks to break the heads, and dropsheets and the wind to separate the grain from the chaff) "invent" devices that will automatically remove grain from heads (producing a drawing of a hypothetical machine as well as an explanation of how that machine or model would work) identify other operations which must be performed as part of field operations in the planting and harvesting of grain discuss seed planting: how deep and at what distance apart challenge students to design a model "seed planter" using simple paper and plastic materials found around the home use a hammer and block as a crude milling device for seeds; challenge students to describe how the equipment would need to be improved to be more effective and to be useful on a large scale use the flour produced by students to make bread; compare the quality of their fresh ground flour to commercially produced flour

Resources

Topic Outline	Student Activities	Resources
<p>4 Improvements in effectiveness, efficiency and quality of life resulting from use of technology</p> <p>5 Power technologies</p> <p>6. Safety considerations</p>	<p>Students:</p> <p>view and read materials that show the advance of technology used in the grain industry</p> <p>identify tasks which need to be done in the transportation, drying, storage and milling of grain</p> <p>describe and/or "invent" machines to perform these functions</p> <p>visit a farm implement dealership or a local farm to examine machinery and learn the principles on which the machinery is based</p> <p>prepare a flow chart to illustrate the steps in production and processing of grain</p> <p>visit a museum to view and examine early grain farming and processing equipment; drawing and describing selected pieces of this equipment</p> <p>prepare a chart that outlines the development of a particular agricultural technology: the chart indicates the problem that was being worked on at each stage and the specific improvement that was made</p> <p>identify power sources in equipment</p> <p>identify means by which power is transferred from one part of a machine to another</p> <p>identify means by which power is transferred from one part of a machine to another</p> <p>identify safety concerns with power equipment: danger points and dangerous operations</p> <p>view and read material that illustrates safe operation of equipment</p>	

THEME 3: Resource Management: Water

Overview

Water is a critical resource to agriculture. In many areas the supply of water is the limiting factor which determines what crop can be successfully grown, and in all areas it influences the size and quality of the crop. The study of water within an agriculture unit thus focuses on the natural supply of water within the province and how that supply can be managed for effective agricultural use.

Objectives

Concepts

- water needs
- water resources
- landforms and water supply
- variation in water supply
- agricultural water use and management
 - soil moisture
 - subsoil water
 - conservation practises
 - irrigation and drainage
- water rights
- water issues

Skills

- interpreting charts and maps
- identifying relationships between water supply and topography
- generating alternatives regarding ways to meet water needs
- evaluating strategies for water management
- identifying tradeoffs in water uses
- identifying land use practises which affect available water

Attitudes

- awareness of the importance of water resources
- awareness and appreciation of water as a limited resource
- conservation ethic
- awareness and appreciation of opportunities for careers in water management

YEAR 1: THEME 3:	RESOURCE MANAGEMENT:	WATER
<p>Topic Outline</p> <ol style="list-style-type: none"> 1. Introduction: for water needs <ul style="list-style-type: none"> - on humans - on plants of different kinds - on the landscape 2. Water sources 3. Water supply <ul style="list-style-type: none"> - weather/climate - natural transport systems 	<p>Student Activities</p> <p>Students:</p> <ul style="list-style-type: none"> consider the effects of a month totally without water <ul style="list-style-type: none"> - on humans - on plants of different kinds - on the landscape observe dried plants and seeds: discuss changes in plants and animals in extreme dry conditions i.e., death and dormancy discuss the role of water in living things <ul style="list-style-type: none"> - water content of living things - water as the basic medium for circulation in living things - water flow through plants: absorption, conduction, transpiration consider how much water is enough to support life: view a film or read about the water needs of particular plants and animals identify sources of water available to living things construct a chart that indicates water sources for a variety of plants and animals review the water cycle and discuss the role of the water cycle in replenishing water supplies identify forms of precipitation and water equivalent identify zones in which rainfall is greatest and least in relation to prevailing winds and topography; e.g., Palliser triangle in Alberta discuss the role of topography in determining rainfall view and interpret graphs or charts which indicate monthly rainfall in selected areas of the province 	<p>Resources</p>

Topic Outline	Student Activities	Resources
<p>3. continued</p> <p>4. Water management</p> <ul style="list-style-type: none"> - local area - provincial, national and international perspective 	<p>Students:</p> <p>discuss variation in rainfall that occurs in yearly cycles and also random variation in rainfall that occurs within the growing season; identify range of rainfall due to local variation in rainfall patterns</p> <p>review and discuss examples of variation in crop production that result from changes in the amount and timing of yearly rainfall</p> <p>read and view material on surface and subsurface water</p> <p>identify major surface water resources in Alberta</p> <p>view or read about subsurface water resources and how they are accessed</p> <p>measure soil moisture – read and discuss factors which affect availability of water e.g.: runoff patterns, summer temperatures</p> <p>read about and discuss techniques for maximizing farm use of yearly water supply: soil moisture conservation</p> <p>measure water hardness and discuss the impacts of water hardness</p> <p>read, view and discuss the range of farm water uses (in addition to direct application to crops) – constructing a model of a section of land including topographic features, water features and related improvements</p> <p>read and view materials on reservoirs and irrigation systems (both large and small scale)</p> <p>prepare a water budget for a farm</p>	

Topic Outline
<p>5. Problems and issues</p>

Student Activities
<p>Students:</p> <ul style="list-style-type: none"> discuss competition for water use, role play or dramatize a water management issue research water resource issues based on newspapers and other media sources debate a water issue read and discuss impacts of agriculture on downstream water quality discuss need for community decisions regarding water use read and discuss international problems in water use

Resources

YEAR TWO PROGRAM

THEME 1: Production, Processing and Marketing

Overview

This unit follows a case study approach. The intent of the unit is to provide a practical study of production, processing and marketing through the direct study of a particular agricultural industry. The meat processing and production industry has been used to illustrate the development of the case study but the approach followed here may be adapted to any other agriculture related industry.

Overall the unit follows a similar form to that of the first unit in the year one program, but for this unit the main focus is on the nutritional value of the products rather than consumer preferences. The unit will thus consider dietary needs as well as the relative nutritional value of various food products prepared in a variety of forms.

Objectives

Concepts

- nutrition (review)
- nutrient composition of foods: proteins, carbohydrates, fats, minerals and vitamins
- consumer needs versus consumer preferences
- products
- merchandising
- processing and packaging
- production (farm operations)
- breed development as a means of increasing quantity and quality of product
- transportation and storage
- local production as a component of provincial and national and international production

Skills

- monitoring personal consumption by nutrient groups
- assessing consumption in relation to nutritional needs
- identifying and classifying products
- comparing alternate sources of nutrient needs
- analyzing steps in processing and packaging
- analyzing role of consumer preferences in determining products and packaging

Attitudes

- awareness of the importance of diet to human growth, development and continuing function of a healthy body
- awareness of the complex and multifaceted nature of a food production industry
- appreciation of the consumer – producer relationship
- appreciation of the role of technologies in the production and processing of food
- awareness and appreciation of opportunities for careers in agriculture related industry

Example Topic: Meat Products

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1. Consumption 2. Nutrient composition of foods: proteins, carbohydrates, fats, minerals and vitamins (review) 3. Monitoring meat consumption and preferences 4. Packaging and marketing 	<p>Students:</p> <ul style="list-style-type: none"> identify meat products commonly used as food, discuss taste and nutritional value of each monitor and classify personal and family consumption of food products; construct charts and graphs of the results estimate the quantity of meat and meat products consumed on an annual basis identify alternate sources of protein discuss factors which affect the type of protein sources used i.e., availability and cost of different forms, nutritional value and cultural values discuss the controversy regarding the role of meat products in meeting nutritional needs view and discuss methods used in preparing meats; comparing the nutritional merits of alternate methods discuss and identify characteristics of different forms of meat products that have appeal for different consumers identify differences in use of products by different cultural groups, and preferences for different kinds of meat products examine advertisements for meat products and identify the appeal to the consumer examine packaging: sizes, forms, labelling and visual layout of packages prepare a hypothetical marketing strategy for a new line of meat products: discuss the nature of the product, who the consumers would be; also design the packaging and a series of advertisements 	
<p>Note: The right hand column has been left blank in this field test draft. Teachers are asked to note references that have been found particularly useful. (See appendix 1 for a listing of related resources)</p>		

Topic Outline	Student Activities	Resources
<p>5. Processing and production</p> <p>6. Breed development as a means of increasing quantity and quality of product</p> <p>7. Career specializations and expertise</p>	<p>Students:</p> <p>examine print and visual materials to learn the steps in meat processing</p> <p>consider one or two products such as hamburger and sandwich meat, examining the steps in the production of these products</p> <p>examine the full range of animal products, identifying characteristics and uses of the various products</p> <p>read or view materials that describe animal production operations: e.g., grazing operations and feed lots</p> <p>read or view materials that describe the relative performance of different breeds</p> <p>read or view materials on the improvement of the quality and quantity of meat production through breed improvement</p> <p>examine the essentials of a beef, hog, sheep or poultry farm operation, i.e.: livestock selection and management, grazing operations, feed production and preparations and sanitary and health considerations</p> <p>identify materials and services that are required to support a farm production, i.e.: workforce and expertise; feed, food supplements and medicines; land, structures and equipment; energy and transportation</p> <p>where possible, visit a beef, hog, sheep or poultry farm</p> <p>construct a network chart that illustrates the interrelationship of occupations in an animal product industry</p> <p>construct a network or flow chart that illustrates the stages of production, processing and marketing of a particular animal product</p>	

Topic Outline	Student Activities	Resources
<p>8. Transportation and storage</p> <p>9. Health Issues</p> <p>9. Local production as a component of provincial, national and international production</p>	<p>Students:</p> <p>read and view materials that describe the transportation and storage of meat products</p> <p>compare alternate technologies for preserving meat: refrigeration, freezing, drying</p> <p>discuss health issues regarding the storage and display of meat products: storage temperature and shelf life</p> <p>read and discuss materials that describe health issues related to the use of hormones and growth supplements in meat production</p> <p>examine print or visual materials that show the production and consumption of animal products at the provincial, national and international levels</p> <p>identify major patterns of trade in meat products at local, provincial, national and international levels</p>	

THEME 2: Technology and Research

Topic: Technology for Planning, Monitoring and Managing

Overview

The process of farm production can be viewed as a series of planned interventions that will enhance the development of a particular food crop. For every action that the farm operator takes there is usually a best time to do it and generally a most effective way. The decisions of when to plant, how deeply, when to provide fertilizers, supplements, or special treatments and what other conditions should be modified are all dependent on a wide range of changing conditions, each of which need to be monitored if appropriate actions are to be taken.

Intensive agricultural production requires an increasingly high level of planning, monitoring and management. Green house production, the raising of specialized animal breeds and the use of integrated pest management are all examples of such intensive production processes.

Objectives

Concepts

- environments
 - environmental factors
 - natural environments
 - artificial environments
 - micro environments
- competition for nutrients, water and light
- plant cycles
- pest and disease management
- control systems
- optimum conditions for plant growth

Skills

- monitoring plant growth and plant health
- measuring soil moisture and humidity
- application of techniques for plant propagation:
 - planting seeds and bulbs, making cuttings
- preparing a "growth chamber" to meet the needs of a particular plant
- identifying variables that affect plant growth
- creative and critical thinking regarding alternate ways to meet plant needs
- maintaining a record of plant treatments and plant growth
- identifying greenhouse pests and weeds

Attitudes

- appreciation of the complexity of plant care in controlled environmental conditions
- appreciation of the need for accuracy and precision in the monitoring and managing of living things
- awareness of career opportunities in plant care and plant research

Example Topic: Greenhouse Management

Topic Outline
<ol style="list-style-type: none"> 1. Introduction to growing plants: some basic techniques 2. Identification of plant needs <ul style="list-style-type: none"> - environmental factors to be considered - general needs - cyclic needs - specialized needs 3. Monitoring the crop

Student Activities
<p>Students:</p> <ul style="list-style-type: none"> collect and dry seeds from food or ornamental plants make cuttings of different kinds of plants propagate plants by means of seed, bulbs, and cuttings visit a greenhouse, nursery, conservatory or plant store; view plant care equipment and procedures view and discuss unhealthy plants, diagnose and discuss possible problems discuss general needs of all plants and identify of specialized needs of plants: light, humidity, soil conditions read, view and identify natural plant environments read, view and discuss cyclic needs of plants: diurnal temperature and light cycles, yearly cycles for light, temperature and moisture read and discuss greenhouse conditions; identify how basic plant needs are met and how conditions are varied to meet particular plant needs monitor the growth of a household plant prepare a growth record of a group of plants and show this development graphically; also include information on plant treatments as part of the record

Resources

Topic Outline	Student Activities	Resources
<p>4. Specialized equipment and systems</p> <p>5. Pest and disease control</p> <p>6. Skills and technologies for plant propagation</p>	<p>Students:</p> <ul style="list-style-type: none"> build a miniature growth chamber using improvised materials e.g., cardboard box and plastic wrap improvise environmental controls in the growth chamber grow plants under varied conditions: light, soil, moisture etc. read about or view the intensive greenhouse production of a particular type of plant crop identify the optimum conditions for production of a particular plant read about or view self regulating control mechanisms that adapt conditions to the changing needs of plants compare home greenhouses to commercial production greenhouses brainstorm, "invent" and produce drawings of future plant environments read about or view the growth of plants under stressful conditions: discuss uses of stress in inducing flowering and fruiting in some species and in the development of bonsai identify plant pests and diseases read about or view techniques for pest management grow plants by hydroponics read about or view the use of specialized treatments to accelerate or extend plant production: i e., pruning, chemical treatments, hormonal treatments 	

Topic Outline	Student Activities	Resources
<p>7. Research</p> <p>8. Applications for particular plant production needs</p>	<p>Students:</p> <p>visit a research facility, view a film or hear a presentation by a guest speaker on a current research topic</p> <p>read about or view new technologies for production of new varieties that adapt well to greenhouse production</p> <p>read about and discuss food needs in difficult climates where food might be produced under controlled conditions</p> <p>read about and discuss the economic costs and benefits: Where is this type of production practical? (e.g., consider the use of waste heat energy from power plants as a source of heat)</p> <p>read, discuss, and brainstorm regarding plant production in space</p>	

THEME 3: Resource Management: Soils

Overview

Soil is a basic agricultural resource. The quality of soils is a major determiner of the success of agricultural production: its loss or degradation is thus of major concern. This unit examines the characteristics of soil that determine its overall quality and considers problems in soil management.

Objectives

Concepts

- soil functions
- soil characteristics
 - composition
 - soil nutrients/essential minerals
 - porosity
 - acidity/alkalinity
- soil development
- nutrient cycles
- soil degradation
 - erosional losses
 - nutrient losses: leaching
 - salinization, alkinization and acidification
- soil management
 - soil assessment
 - tillage
 - chemical treatments/recycling of nutrients
- fertilizing: organic and inorganic nutrients
- worldwide soil problems
 - loss of arable land through erosion
 - loss of land through urbanization and transportation corridors
- soil management for household gardening

Skills

- classifying soil components
- describing soil types
- measuring mineral content of soil
- measuring pH of soil
- identifying appropriate measures for preventing erosion in given situations
- identifying and describing problems in soil management
- identifying alternatives in soil management
- growing plants without soil

Attitudes

- awareness of the importance of soil resources
- awareness of the effect of land use decisions on soil retention and soil characteristics
- awareness and appreciation of soil as a limited resource
- conservation ethic
- awareness and appreciation of opportunities for careers in soil science and soil management

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1. Functions of soil 2. Soil characteristics 3. Relationship to environment/soil development 	<p>Students:</p> <ul style="list-style-type: none"> view a plant without soil (include roots, stems and leaves), and discuss how the plant is adapted for survival; focus on the plants adaptation for life in soil review plants that naturally grow in soilless environments: discuss ways in which these plants are specialized discuss adaptations of plants to soil view film or video to introduce soil components and types of soil examine soil using a hand lens separate soil components by sieving and by sedimentation identify components identify origins of soil components identify soil types by proportion of components discuss "soil manufacture": How would you go about making soil from scratch? read, view and discuss natural processes of soil development observe decomposition of organic materials in a classroom or outdoor mini-study: (1) on the surface of soil, (2) in subsurface conditions prepare and observe compost examine soil by hand lens and microscope to observe microscopic and invertebrate fauna 	

Topic Outline	Student Activities	Resources
<p>3. continued</p> <p>4. Plant adaptations to specialized soil conditions</p> <p>5. Soil management</p> <ul style="list-style-type: none"> - soil nutrients - natural cycles and fertilizers - chemical manipulation - mechanical manipulation of soil <p>6. Soil losses</p> <ul style="list-style-type: none"> - erosion - loss through urbanization - percolation, leaching, salinization and alkanization 	<p>Students:</p> <p>identify nutrient cycles in natural and agricultural systems</p> <p>test soil for mineral composition</p> <p>test soil for pH .</p> <p>read, view and discuss material that outlines different nutrient and soil needs of different plants</p> <p>view similar plants growing under different soil conditions and/or different soil treatments</p> <p>view plants that have grown under extreme soil conditions, observing adaptations and signs of stress</p> <p>read and view material that describes different soil management practises</p> <p>read, view and discuss soil management alternatives, i.e., chemical manipulations vs recycling of organic materials, cultivation vs no cultivation, irrigation vs water conservation</p> <p>examine soil properties in relation to water: water capacity and porosity</p> <p>identify soil, terrain and climatic factors that contribute to erosion</p> <p>observe erosion in city and farm settings</p> <p>observe effects of evaporation on soil surfaces</p> <p>read and view materials on the effects of water on movement of soil nutrients and pollutants</p> <p>identify land use decisions and their effect on soils</p>	

Topic Outline	Student Activities	Resources
<p>7. Local, provincial, national and international problems in soil management</p> <p>8. Soil management in urban and indoor environments</p> <p>9. Soil issues</p>	<p>Students:</p> <p>read, view and discuss soil conservation practises and problems in other countries, e.g., slash and burn soil use, erosional problems of Ethiopia and of Western China</p> <p>read, view and discuss the effects of urbanization on soils</p> <p>read, view and discuss practises for maintenance of urban soils</p> <p>read, view and discuss soils used for indoor gardening</p> <p>discuss artificial environments, comparing soil management procedures used in indoor plant operations with soil development and maintenance within natural environments</p> <p>discuss issues related to soil management</p>	

YEAR THREE PROGRAM

THEME 1: Production, Processing and Marketing

Overview

This unit follows a case study approach. The intent of the unit is to provide a comparative study of two or more agriculture industries, examining energy and resource inputs in relation to food production. The key idea of the unit is that different forms of agricultural production and processing each have implications for the amount of energy and other resources required. The energy used in food production contributes in various ways to the final energy of the food product, but this food energy is generally very small in relation to the large energy expenditure involved in its production and processing.

The outlines provided for this case study use the beef industry and the production of vegetable crops as examples, but the approach followed here may be adapted to other agriculture related industries.

Objectives

Concepts

- range of food crops
- consumption
- consumer needs and preferences
- products
- merchandising
- processing and packaging
- production (farm operations)
- transportation and storage
- inherent and invested energy
- food pyramid
- local production as a component of provincial, national and international production

Skills

- assessing consumer needs and preferences
- assessing energy content of food
- comparing and classifying products
- analyzing steps in processing and packaging
- identifying steps in which invested energy is added
- identifying role of consumer preferences in determining products and packaging

Attitudes

- awareness of the complex and multifaceted nature of a food production industry
- awareness of the role of energy in food production
- appreciation of the consumer – producer relationship
- appreciation of the role of technologies in the production and processing of food
- awareness and appreciation of opportunities for careers in agriculture related industry

Recommended Topic: Field Crops: Food and Forage

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1. Food crops 2. Food consumption 3. Product preferences 	<p>Students:</p> <p>identify the variety of products which are produced as field crops in Alberta for direct human consumption, identifying characteristics and uses of the various products</p> <p>monitor and record personal and family consumption of food products; classify the foods according to origin and form, i.e.: (1) plants in original form, (2) processed plant products, (3) meat, (4) processed meat products and (5) mixed source processed products. Note that may foods will not fit neatly into these categories. Some discussion will be needed to come to terms with what is meant by a processed food.</p> <p>construct charts and graphs of the results</p> <p>estimate the quantity of products consumed in a year: (1) by individuals at different age levels and (2) by a community of people, such as the community made up of the families of all members of the class</p> <p>identify differences in use of products by different age groups, and preferences for different groups of products</p> <p>discuss reasons for different patterns of food use (Identify food preferences, concerns regarding additives, cultural patterns, economic considerations, time and convenience considerations etc.)</p> <p>discuss and identify characteristics of different forms of food products that have appeal for different consumers</p> <p>examine advertisements for products and identify the appeal to the consumer</p>	
<p>Note: The right hand column has been left blank in this field test draft. Teachers are asked to note references that have been found particularly useful. (See appendix 1 for a listing of related resources)</p>		

Topic Outline	Student Activities	Resources
<p>4. Energy consumption</p> <p>5. Energy investment in food (e.g., fuel, fertilizers, processing, packaging)</p> <p>6. Local farm operations</p>	<p>Students:</p> <ul style="list-style-type: none"> use charts that show the energy content of various foods, determine personal food energy consumed compare total food energy consumed with average figures regarding food energy needs compare the food energy of different diets, including some typical examples from third world countries examine packaging: sizes, forms, labelling and visual layout of packages monitor and record the quantity of packaging that comes with a week's supply of the family groceries read and discuss material that describes the energy cost of food processing and packaging create a new product, design a package for the product and market the product in school prepare a marketing strategy for a line of products designed for consumers who prefer a minimum of processing and packaging identify energy cost in farm production, i.e., fuel and fertilizers read or view materials which describe the field production of vegetable crops read or view materials which describe the production of beef cattle read or view materials that indicate the quantity of food that can be produced per hectare of various field crops read or view similar data on the production of forage crops 	

Topic Outline	Student Activities	Resources
<p>7. Energy Analysis</p> <p>8. Food and energy alternatives</p>	<p>Students:</p> <ul style="list-style-type: none"> analyze the energy requirements for production of various types of food crops construct a food production and processing chart that shows the energy inputs at each stage discuss the concept of a food pyramid, identify the proportion of forage crop food value that is converted to food value of meat product discuss the food and energy tradeoffs in using land for producing cattle feed rather than for raising crops for direct human consumption read and view materials which describe intensive methods of food production, requiring large amounts of energy and equipment; discuss the energy implications of these food production methods read and view materials that describe alternative methods of food production, including methods which use minimal inputs of energy and materials identify regions in Alberta and Canada where soil and climate support high levels of productivity; identify other regions where production is marginal identify regions of Alberta that are more suited to grazing than to production of field crops read or view materials which compare agriculture in Canada to the agriculture of third world countries; discuss difference in use of technologies and discuss reasons for these differences read or view material that compares the consumption of processed and packaged foods in Canada with consumption patterns in other parts of the world; discuss reasons for these differences 	

THEME 2: Technology and Research

Overview

The production of high quality animal and plant products requires genetic strains that respond well to the conditions of production. In part, this is a matter of efficiency: only those breeds that can make the most effective use of nutrients available and that will produce the highest quality product will compete well in the marketplace. In many cases it is also a matter of health and survival. Increased use of intensive farm production, often based on raising a single crop or breed, has led to increased susceptibility to disease and to pests. Resistant varieties must be developed to keep pace with increasingly intensive farm production practises.

This unit examines the application of biotechnology to large animal production. A variety of practises are considered, including those practises that are used in developing high quality stock and those that are aimed at enhancing the growth and development of existing breeds.

Objectives

Concepts

- breeds and varieties
- genetic characteristics
- principles of cattle breeding
- artificial insemination and embryo transplants
- growth supplements and food additives
- hormones
- biotechnology

Skills

- observing animals and interpreting their particular characteristics
- comparing strengths and weaknesses of different breeds
- identifying desirable characteristics
- identifying risks and benefits of use of specialized breeds

Attitudes

- respect for animal welfare
- awareness of the role of research and biotechnology in agricultural industries
- awareness of the complex and multifaceted nature of large animal production
- awareness and appreciation of opportunities for careers in biotechnology and veterinary science

Example Topic: Large Animal Production

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1. Production: what is desired 2. Varieties and breeds 3. Reproduction and breeding 	<p>Students:</p> <ul style="list-style-type: none"> discuss consumer demands for high quality beef, identify characteristics that are desired in beef cattle identify the many kinds of products for which beef cattle are used; include both food and non food uses describe, draw or make models of what the ideal beef cattle would be like read about, view and discuss the variety of breeds of beef cattle and compare data regarding their relative strengths and weaknesses discuss the need for specialized breeds read about, view and discuss problems which may arise in beef production; identify ways in which breed development might lessen or eliminate those problems identify diseases and ailments to which cattle are particularly prone, identify cattle breeds that have greater and lesser resistance to these ailments identify breeds of cattle that are particularly suited to specialized conditions read or view materials which illustrate the distribution of breeds throughout the province hear a farm speaker describe cattle breeds and the need for particular breed characteristics read about or view media materials that describe general principles of cattle breeding read about or view materials which describe the care of cows and calves if possible, visit a cow-calf farm operation 	

Topic Outline
<p>4. Enhanced breeding technologies</p> <p>5. Growth supplements, hormones and medicines</p> <p>6. Issues and controversies</p> <p>7. Canada's role in biotechnology</p>

Student Activities
<p>Students:</p> <p>read about and view techniques for artificial insemination and in vitro fertilization</p> <p>read about or view media that introduces new genetic technologies and technologies currently under research; discuss the possibilities for future breed development</p> <p>read about, view and discuss the use of growth supplements</p> <p>identify the kinds of treatments that cattle may have to ensure rapid growth</p> <p>identify the kinds of treatments used to prevent or control disease</p> <p>read about or view materials that identify concerns regarding residual effects of treatments and additives in finished meat products; identify standards which must be met to avoid danger to human health</p> <p>debate the value of use of hormones to increase milk production</p> <p>discuss questions of ownership: should a person who has developed a new breed have some kind of ownership of that breed</p> <p>discuss questions regarding concentrating production in very specialized breeds; who will maintain a basic stock of past breeds?</p> <p>read about and discuss Canada's role as a leader in biotechnology</p> <p>identify plant and animal breeds that have been developed in Canada and are now used worldwide</p> <p>discuss Canada's special needs for breed development to suit its northern climate</p>

Resources

THEME 3: Resource Management: Land Use

Overview

This unit examines the scope and implications of land use practises. It considers land uses within urban areas as well as rural areas and it examines the basis on which land use decisions are presently made. Key issues are identified and consideration is given to alternatives for the future.

A main theme of the unit is that decisions regarding land use play a large part in determining the nature and extent of agricultural production. What land will to be used for agricultural purposes and what crops will to be raised are questions that are continually under review. Currently decisions that are made on land use are based largely on economic and practical considerations as seen by the land holder, but increasingly the decisions are becoming a matter of public concern. Both technical and societal considerations will play increasing roles in future land use planning.

Objectives

Concepts

- agricultural land use considerations:
 - quality of soil
 - topography
 - water and climate
 - market value of products
 - costs of operation
 - experience and livelihood of land holder
- available technology
- other land use considerations:
 - urbanization and industrialization
 - resource extraction needs (mining and drilling operations)
 - public concerns regarding environmental quality
 - maintainance of natural environments
- historical change in land use
- sustained yield

Skills

- interpreting topographical features on maps and aerial photos
- analyzing land use within a given area
- identifying land use issues
- evaluating alternative land uses
- interpreting a farmstead plan
- drawing a rough site plan for a city lot

Attitudes

- appreciation of the diversity of values that come into play in land use decisions
- valuing both the need for agricultural land and the need for natural environments
- awareness and appreciation of opportunities for careers in land use planning

Topic Outline	Student Activities	Resources
<ol style="list-style-type: none"> 1 Assessment of potential land use 2. Planning in urban areas <ul style="list-style-type: none"> - planning and zoning - layout and landscaping within a site 	<p>Students:</p> <ul style="list-style-type: none"> brainstorm potential uses of a vacant lot (based on an example piece of land within the community) brainstorm potential uses to which a local piece of farmland might be put: include agricultural uses and non agricultural uses rate the alternatives and provide a rationale for the ratings identify factors which determine land use in urban areas examine newspapers for items which deal with zoning and rezoning of properties discuss reasons for zoning examine a neighbourhood plan; identify areas for housing, for transportation corridors, for community services and for parkland examine a city or town map that shows the overall zoning plan for the city estimate the amount of green space per person and also the amount of space covered by improvements of various kinds classify the green space within cities according to use; e.g.: lawns, ornamental gardens, vegetable and fruit gardens, wooded areas, water and wetlands, farmland identify areas in the city plan devoted to industry, discuss why major industries are usually located together, but separate from residential areas examine sample site and landscape plans for urban properties prepare a plan for a flower bed design and/or model a landscape plan for a city lot 	

Topic Outline	Student Activities	Resources
<p>3. Planning in rural areas: farmstead planning</p> <ul style="list-style-type: none"> - assessment of land - layout of farmstead <p>4. Competing land uses</p> <ul style="list-style-type: none"> - farming versus non-agricultural land needs - selection of appropriate crops and livestock <p>5. Problems related to land use</p>	<p>Students:</p> <ul style="list-style-type: none"> identify factors which determine agricultural land use review soil assessment and its role in determining land use read about, view and discuss agricultural land uses in the local area hear a presentation by a district agriculturist on local land use practises read about, view and discuss the layout of farmsteads if possible, visit a farmstead and make a map showing the layout of agricultural operations and farm improvements examine historical material regarding the local community; compare present land use in the local area to that of fifty years ago collect and discuss examples of land use controversies from newspapers and other media; identify the basis for positions taken by different groups read about and discuss land use practises that degrade agricultural land: overgrazing, overuse of available moisture and minerals, exposure to erosion, inappropriate irrigation practice, and removal of natural pest control organisms discuss the concept of sustained yield read about and view agricultural practises that alleviate or lessen these problems read about and discuss changes in global land use 	

Resources

Student Activities
<p>Students:</p> <ul style="list-style-type: none">read about and view media materials that describe alternative future land uses, discuss the implications of these possible changes in land usediscuss the impacts of increasing population, industrialization and urbanization on land use

Topic Outline
<p>6. Agriculture and the future</p>

OPTIONAL UNITS

RECOMMENDED OPTIONAL UNITS

The following outlines provide a suggested treatment for each recommended topic.

1. Agriculture and Human History
 - the emergence of agriculture
 - early techniques and practises
 - the effects of agriculture on historical development
 - locations and patterns of human settlement
 - population
 - trade and commerce
 - invention, innovation and mechanization
 - current practises
 - standard of living and lifestyle
2. Agricultural Horizons: An Examination of Agriculture Around the World
 - food and culture: what is considered food?
 - quality and quantity of food consumption: what do others eat?
 - production practises
 - resources
 - mechanization
 - global food supply
 - international roles of Alberta and Canada
3. Agricultural Services
 - primary, secondary and service industries
 - extent of farm service industries
 - study of example services
 - equipment and machinery
 - supplies
 - transportation and marketing
 - services to farm families
4. Animal Care
 - types of animals: pets, working animals, livestock and wildlife
 - varieties, genetics and breeding
 - example study
 - characteristics
 - growth
 - environmental needs
 - health needs and care
 - humane considerations
5. Bee Keeping
 - bees: characteristics and life cycles
 - culture and care of bees
 - hive location, environments, and bee forage
 - harvesting and processing of honey
 - hive management and safety considerations

6. Cattle

- types, genetics, breeding
- production
- products
- health and care
- economic aspects
- related industries

7. Computers and Agriculture

- application to planning and farm management
 - accessing and use of data bases
 - record keeping
 - financial planning
 - planning for the future
- applications to automated mechanical systems
 - monitoring, feedback and control systems
 - computerization in existing mechanical systems
 - design and function of future systems

8. Crop Protection

- insects: damage, reproduction, population growth
- plant diseases
- abiotic factors
- weeds
- herbicides and pesticides

9. Farming and Wildlife

- habitat alteration
 - wetlands
 - forests
- competition for food
- wildlife or pests
- game farming
- harvesting native plants

10. Forage Crop Production

- types, genetics, breeding
- nutritional assessment
- production
- harvesting, processing and storage
- economic aspects

11. Fruit Crops

- types and varieties
- growth forms
- production
- packaging and processing of fresh fruits
- production and processing of preserved products

12. Fur Farming

- types
- breeding
- health, feeding and care
- processing and preparing furs
- trapping and conservation issues

13. Hogs

- types, genetics, breeding
- production
- products
- health and care
- economic aspects
- related industries

14. Home Gardening and Food Production

- garden environments: what conditions are important?
- soil assessment, enhancement and maintenance
- gardening techniques
- selecting crops; characteristics and needs of common garden plants
- selecting varieties, interpreting the supplier's information
- planning and laying out the garden
- getting an early start: hotbeds and coldframes
- crop protection
- harvesting, storage and preservation of garden crops
- alternative approaches to gardening

15. Horses

- characteristics and structure
- types, genetics, breeding
- uses: work, pleasure, sport
- growth
- care and training
- marketing

16. Imports and Exports

- food as a global resource
 - where does our food come from?
 - what foods do we import?
 - why do we import some foods rather than produce our own?
 - Alberta exports
 - what products does Alberta produce that are surplus to our needs?
 - what countries have need of products produced in Alberta?
 - what is exported?
 - where do the products go?
- transportation and shipping

17. Indoor Gardening

- household plants: needs, monitoring and maintenance
- artificial environments for meeting plant needs
 - greenhouses
 - artificial lighting
 - hydroponics
- selecting plants, familiarity with some common plants
- floriculture

18. Irrigation

- needs
- planning: large and small scale
- equipment
- irrigation in Alberta
- special problems: changes in drainage salinization and patterns
- economics

19. Landscape and Trees

- lawns and turf
- trees and shrubs
- pruning, grafting, budding, thinning
- selection of appropriate varieties
- design

20. Marketing and Advertising

- the consumer: wants and needs
- processing and packaging to appeal to the consumer
 - convenience foods
 - package appeal
- advertising strategies
 - examples and principles
 - making advertisements
- being an intelligent consumer
 - food value and price value
 - packaging costs and product costs

21. Market Gardening

- markets and market preferences
- choice of varieties for production
- seasonal production
- intensive production practices
 - mechanical and hand labor
 - specialized equipment and skills
 - crop protection
- preparing and packaging products
- pricing and marketing

22. Marketing Systems

- direct sales
- local, provincial, national and international markets
- need for marketing systems
- marketing agencies: cooperatives, free markets, marketing boards and government
- quotas and subsidies
- assessing and regulating quality of products

23. Mushroom Farming
 - characteristics and life cycle of mushrooms
 - natural occurrence
 - culture and growth
 - species control and safety
 - growth environments
 - production, packaging and marketing

24. Oilseed (Canola)
 - plant varieties, characteristics
 - crop production
 - harvesting
 - processing, distribution and marketing of oil as food
 - non-food products and uses

25. Planning and Finances: the Business side of Farming
 - simulated farming: case study
 - records: physical and financial resources
 - budgets
 - costs and usage of land
 - decision making
 - computer applications

26. Poultry
 - types, genetics, breeding
 - production
 - products
 - health and care
 - economic aspects
 - related industries

27. Processing and Preserving
 - spoilage and shelf life
 - refrigeration and freezing
 - sterilization and canning
 - drying
 - irradiation
 - chemical additives
 - preservation projects
 - past and future techniques

28. Research and Technologies
 - species development
 - improvements in monitoring and measuring
 - improvements in environmental controls
 - mechanization
 - current areas of research
 - apprentice research project

29. Sheep and Goats
 - types, genetics, breeding
 - production
 - health and care
 - economic aspects
 - related industries

30. Sugar
 - sugar and energy
 - sugar beets
 - irrigation
 - production
 - processing
 - sugar cane
 - international production and marketing

31. Transportation
 - farm needs and products
 - fertilizers and chemicals
 - livestock and feed
 - perishable foodstuffs
 - long and short distance transportation
 - economics of production and distance to markets

32. Trapping
 - history and development of fur industry
 - fur bearing animals
 - humane trapping
 - equipment
 - safety considerations
 - trapline preparation and management
 - preparing and processing furs
 - conservation and protection issues

33. Tree Farming
 - land suitability and location
 - conservation considerations
 - products and markets
 - varieties and growth characteristics
 - preparation, planting and care

34. Weather and Crop Management
 - frost and crop damage
 - effects of too much and too little moisture
 - hail and hail damage
 - weather modification
 - crop management practises
 - personal health and weather (rain, dust, heat and sunlight)

RESOURCES

Recommended resources for the theme based units are currently under development. For a copy of pilot resources applicable to the year one program, contact Mrs. Betty Gabert, Education Specialist, Alberta Agriculture, 2nd Floor, J.G.O'Donoghue Building, 7000 – 113 Street, Edmonton, Alberta, T6H 5T6, (phone 427-2402). Materials for years two and three will not likely be available until the 1988-1989 school year.

A compilation of supplementary resources which may also be useful in teaching the program is provided on the pages which follow. Note that this listing is an initial working draft and that it represents only a preliminary search for resources. As such there are a number of optional topics for which no resources have yet been identified. Space is provided for users to write in bibliographic information on other resources that have been found useful.

The format of the listing provides for categorization of resources according to both the intended audience and the scope of the content. Resources that are primarily for teacher use are identified separately from those primarily intended for direct use by students; and those resources which include suggested activities are listed separately from those which contain information only.

In requesting resources from the identified suppliers the following information may be useful:

ALBERTA AGRICULTURE requires that all requests for materials be on school letterhead and normally provides only single copies, (several copies for some items on special request). Schools are asked to restrict their orders to 50 items each year. Requests for items should be forwarded to the following address:

Print Media Branch.
Alberta Agriculture,
7000 – 113 St.
Edmonton, Alberta
T6H 5T6

AGRICULTURE CANADA publications requests should be forwarded to:

Agriculture Canada
Information Division
Ottawa, Ontario
K1A 0C7

UNITED STATE DEPARTMENT OF AGRICULTURE publications requests should be forwarded to:

Ag in the Classroom
Room 227 – W
United State Department of Agriculture
Washington, D.C., U.S.A.
20250

Audio-visual resources as well as additional print resources are identified in the draft publication Agriculture Resources Guide, (Alberta Agriculture, 1987). An advance copy of this publication will be forwarded to teachers who participate in the field test of the junior high agriculture program.

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Partners</u>, 1985, Classroom Agriculture Program Room 241 2116 - 27 Avenue N.E. Calgary, Alberta T2E 7A6 (291-4800) aimed at lower age</p> <p><u>Food and Energy</u> n.b. INTRODUCTION 1986, Ontario Ministry of Agriculture and Food</p>	<p>STUDENT: REFERENCE ONLY</p> <p>Murphy, Wendy B., 1984, <u>The Future World of Agriculture</u>, Walt Disney Productions</p> <p><u>Silent Partner in Thousands of Alberta Businesses</u>, undated, Alberta Agriculture</p> <p><u>Careers in the Agriculture-Food System</u> 1985, Agriculture Canada</p> <p><u>A Tribute to the American Farmer</u> 1985, Cyanamid, Agricultural Division</p> <p><u>Nature of Things: Cheese</u> 1986, C.B.C.</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Issues in Agriculture</u>, Saskatchewan Agriculture, 1986,</p> <p><u>Issues in Agribusiness</u> 1986, Middlesex County (Ontario) Board of Education</p> <p><u>Farm Facts (for city folk)</u> 1983, Canadian Agricultural Chemicals Association</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Men, Machines and Land</u> Farm and Industrial Equipment Institute 410 North Michigan Avenue Chicago, Illinois 60611</p> <p><u>Resource Guide to Educational Materials about Agriculture</u>, USDA, 1983</p> <p><u>Starting a Farm in Canada</u>, 1983, Agriculture Canada</p> <p><u>Farming in Canada</u>, 1983, Agriculture Canada</p> <p>Update – food systems and agriculture newsletter, twice yearly, Ontario Ministry of Agriculture and Food, and Ontario Ministry of Education</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Nutrition: the Ins and Outs</u>, 1983, Alberta Agriculture</p> <p><u>Alberta Cattle, for superior performance</u> 1986, Alberta Agriculture</p> <p><u>Canadian Cheddar Cheese</u> 1977, Agriculture Canada</p> <p><u>Instant Skim Milk in Cooking and Baking</u> 1978, Agriculture Canada</p> <p><u>Yogurt</u> 1978, Agriculture Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Dairy Production Course</u> 1986 (revision), Alberta Agriculture, Home Studies Program (\$30 for 10 lessons)</p> <p><u>Making Dairy Products at Home</u> 1984, Agriculture Canada</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm:</u> USDA, 1980</p> <p><u>Minerals and Vitamins for Dairy Cows</u> 1979, Agriculture Canada</p> <p><u>Electric Power for Dairy Farming</u> 1971, Trans Alta Utilities</p> <p><u>Food for Thought – a series of Quick Facts on Food and Nutrition</u> 1986, Ontario Ministry of Agriculture and Food</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>FERTILE FIELDS AND FERTILIZERS</u>, Esso Chemical Canada Ltd., 1980</p> <p><u>Anhydrous Ammonia</u>, Esso Chemicals Canada Ltd., 1981</p> <p><u>The Operation of a Grain Elevator</u> Alberta Pool, undated</p> <p><u>Students Story of Wheat</u>, 1983, Alberta Wheat Pool</p> <p><u>Grain Varieties in Alberta</u>, 1981, Alberta Wheat Pool</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm: Growing Wheat</u> USDA, 1986 very U.S. orientated</p> <p><u>Safety Guide for Farming</u>; 1987, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Water and Agriculture (Student)</u> 1987, Alberta Environment</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Water and Agriculture (Teacher Guide)</u> 1987, Alberta Environment</p>	<p>TEACHER: REFERENCE ONLY</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Canada is Cattle Country</u>, 1984 Beef Information Centre 238, 2116 - 27 Avenue N.E. Calgary, Alberta T2E 7A6 (403) 277-2396</p> <p><u>Pasture to Plate</u>, 1984 Alberta Cattle Commission 241, 2116 - 27 Avenue, N.E. Calgary, Alberta T2E 7A6 291-4800 aimed at the very young</p> <p><u>Food and Energy</u> 1986, Ontario Ministry of Agriculture and Food n.b. section 2 – The Constituents of Food</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Nutrition Guide: Lookin' good, feelin' good with beef</u> Beef Information Centre (since 1985) address at left</p> <p><u>Beef Nutrition Posters</u> (set of four) Beef Information Centre</p> <p><u>Protein Machines: Converting Roughage to Human Food</u>, undated, University of Guelph</p> <p><i>continued on next page</i></p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Beef Builds Better Bodies</u>, 1984 Beef Information Centre reproducibles included</p> <p><u>Pork – the Nutrition Connection</u> undated, Ontario Pork Producers' Marketing Board</p>	<p>TEACHER: REFERENCE ONLY</p> <p>i <u>People on the Farm: Broiler Growers</u> ii <u>People on the Farm: Raising Beef Cattle</u> iii <u>People on the Farm: Corn and Hog Farming</u> all USDA, 1980 U.S. content</p> <p><u>Feedlot Finishing of Cattle</u> 1981, Agriculture Canada</p> <p><u>Meat Shopper's Guide</u> 1979, Agriculture Canada</p> <p><i>continued on next page</i></p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY <i>continued</i></p> <p><u>Nutrition: the Ins and Outs</u>, 1983, Alberta Agriculture</p> <p><u>Alberta Cattle, for superior performance</u> 1986, Alberta Agriculture</p> <p><u>Butcher's Tour of Alberta Pork</u>, 1975, Canadian Pork Council</p> <p><u>Food for Thought – a series of quick facts on food and nutrition</u>, 1986, Ontario Ministry of Agriculture and Food</p> <p><u>Food</u>, March, 1986, in <u>Newscience</u> Ontario Science Centre</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY <i>continued</i></p> <p><u>Nutrient Value of Some Common Foods</u> 1979, Health and Welfare Canada</p> <p><u>Pork</u> 1975, Canada Pork Council, Ottawa</p>

STUDENT: ACTIVITIES INCLUDED

Food and Energy
1986, Ontario Ministry Of Agriculture and Food
n.b. section 3, Food Production

STUDENT: REFERENCE ONLY

The Wizard of Waste: Converting Waste Heat to Food, undated, The University of Guelph

Gardening on the Prairies: Roger Vick, Western Producer Prairie Books, 1987

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

University of Alberta Home Gardening Course: T. Shaw, (Ed.), University of Alberta, 1986

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>A Mini Unit on Soil</u> 1986, J. Christopher and R. Borelli Ontario Ministry of Agriculture and Food</p> <p>Studying Soil 1976, W. MacKillican McGraw-Hill Ryerson</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Soils Course</u> 1984, Alberta Agriculture, Home Studies Program (\$30 for 10 lessons)</p> <p><u>A Proposed Study Package on Soil</u> 1985, Canadian Society of Environmental Biologists</p> <p>Soil Ecology 1973, W.A. Andrews, Prentice-Hall</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Soil Erosion by Wind</u> 1966, Agriculture Canada</p> <p><u>Soil at Risk: Canada's Eroding Future</u> 1984</p> <p>Standing Senate Committee on Agriculture, Committees and Private Legislation Branch, The Senate of Canada, Ottawa, Ontario, K1A 0A4</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Food and Energy</u> 1986, Ontario Ministry of Energy and Food</p> <p>n.b. section 3 ENERGY AND FOOD</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Farm Energy Management in Alberta</u> 1982, Alberta Agriculture</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Simple Farm Energy Audit</u> 1982, Alberta Agriculture</p> <p><u>Alberta Forage Course</u> 198, Alberta Agriculture, Home Study Materials (\$30 for 8 lessons)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm: Growing Wheat</u> USDA, 1980 very U.S. in content</p> <p><u>Alberta Forage Manual, 1981</u> Alberta Agriculture</p> <p><u>Hay and Forage Harvesting Methods</u> 1976, Alberta Agriculture</p> <p><u>Saving Energy and Dollars on the Farm</u> 1985, Agriculture Canada</p> <p><u>Conservation Farming</u> 1980 Deere and Company, Moline, Illinois may be available for John Deere Technical Services</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Food and Energy</u> 1986, Ontario Ministry OF Agriculture and Food</p> <p>n.b. section 3 Food Production</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Animal Health Course</u> 19 , Alberta Agriculture, Home Studies Program (\$30 for 5 general and 2 of 7 optional lessons)</p> <p><u>Alberta Cattle Nutrition Course</u> 19 , Alberta Agriculture, Home Studies Program (\$30 for 8 lessons)</p>	<p>TEACHER: REFERENCE ONLY</p>

STUDENT: ACTIVITIES INCLUDED

STUDENT: REFERENCE ONLY

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

STUDENT: ACTIVITIES INCLUDED

STUDENT: REFERENCE ONLY

Gumby, Lise, 1983, Early Farm Life, Crabtree
Publishing Company, Toronto

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

Men, Machines and Land Farm and Industrial
Equipment Institute
410 North Michigan Avenue
Chicago, Illinois 60611

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p>

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TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Rabies and Livestock</u> 1968 Agriculture Canada</p> <p><u>Rabies and Your Pet</u> 1977, Agriculture Canada</p> <p><u>Raising Rabbits</u> 1982, Agriculture Canada</p> <p><u>Guinea Pigs</u> 1974, Agriculture Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Livestock on Small Farms</u> 1982, Agriculture Canada</p> <p><u>Protein Sources for Livestock</u> 1973, Agriculture Canada</p> <p><u>Raising Meat Rabbits in Alberta</u> 1983, Alberta Agriculture</p>

STUDENT: ACTIVITIES INCLUDED

STUDENT: REFERENCE ONLY

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

Beehive Construction
1976, Agriculture Canada

Build Your Own Pollen Trap
1985, Alberta Agriculture

The Prairie Beekeeping Manual
1986, Alberta Agriculture

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Canada is Cattle Country</u>, 1984 Beef Information Centre 238, 2116 - 27 Avenue N.E. Calgary, Alberta T2E 7A6 (403) 277-2396</p> <p><u>Pasture to Plate</u>, 1984 Alberta Cattle Commission 241, 2116 - 27 Avenue N.E. Calgary, Alberta T2E 7A6 (403) 291-4800 aimed at the very young</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Nutrition Guide: lookin' good feelin' good with beef</u> Beef Information Centre (address as at left)</p> <p><u>BEEF NUTRITION POSTERS</u> (set of 4) Beef Information Centre</p> <p><u>Protein Machines: Converting Roughage to Human Food</u>, undated, University of Guelph</p> <p><u>Alberta Cattle for Superior Performance</u> 1986, Alberta Agriculture</p> <p><u>Answers About Beef – Our Renewable Resource</u> undated (very new), Alberta Cattle Commission</p> <p><u>Know More About Cattle</u> undated, Beef Information Centre</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Beef Builds Better Bodies</u> Beef Information Centre (address as above) includes reproducible material</p> <p><u>Alberta Cattle Nutrition Course</u> Alberta Agriculture, Home Study Program (\$30 for 8 lessons)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm: Raising Beef Cattle</u> USDA, 1980 U.S. content</p> <p><u>Irrigated Pastures for Cattle in Western Canada</u>, 1974, Agriculture Canada</p> <p><u>Grazing Systems for Alberta Ranges</u> Alberta Agriculture, 1979</p> <p><u>Brands and Branding</u>, 1978 Alberta Agriculture</p> <p><u>Feedlot Finishing of Cattle</u> 1981, Agriculture Canada</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Farm Computer Course</u> 19 , Alberta Agriculture, Home Studies Program (\$25 for 8 lessons)</p>	<p>TEACHER: REFERENCE ONLY</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Pest Control in Canada</u> 1984 Alberta Agriculture Originally written for senior high</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Weed Seedling Identification</u> 1986, Manitoba Agriculture and Alberta Agriculture</p> <p><u>Gardening on the Prairies</u> Roger Vick, Western Producer Prairie Books, 1987</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Weeds Course</u> 19 , Alberta Agriculture, Home Studies Program (\$30 for 8 lessons)</p> <p><u>Crop Protection Course</u> 19 , Alberta Argiculture, Home Studies Program (\$30 for 8 lessons)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Microbial Insecticides in Canada: Their Registration and Use in Agriculture, Forestry and Public and Animal Health</u>; Entomological Society of Canada, 1986 (Very Technical)</p> <p><u>Spoilage of Farm Stored Grain by Molds, Insects and Mites in Western Canada</u>, 1971 Agriculture Canada</p> <p><u>Pesticides for Home and Garden</u> 1984, Agriculture Canada</p> <p><u>Pesticides, Their Implications for Agriculture</u> 1973, Agriculture Canada</p> <p><u>Controlling Brush in Alberta</u> undated, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Wildlife Habitat: a handbook for Canada's prairies and parklands</u> 1981, Environment Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Managing Problem Wildlife in Alberta</u> undated, Alberta Agriculture and ENR</p> <p><u>Prevention of Road Floodings Caused by Beaver</u> undated, Alberta Fish and Wildlife</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Forage Course</u> (Home Studies Program) 8 booklets – complete coverage, high reading level (cost \$30)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Irrigated Pastures for Cattle in Western Canada</u> 1974, Agriculture Canada</p>

STUDENT: ACTIVITIES INCLUDED

Fruit Growing Industry in Canada, Brian Smith
Vanwell Publishing, 1986

STUDENT: REFERENCE ONLY

Gardening on the Prairies,
Roger Vick, Western Producer
Prairie Books, 1987

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

Alberta Saskatoons
1984, Alberta Agriculture

University of Alberta Home Gardening Course,
T. Shaw (ed.), University of Alberta, 1986

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Mink Management and Nutrition</u> 1975, Agriculture Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Pork Production Course</u> Alberta Agriculture, Home Studies Program (\$30 for 7 lessons)</p> <p><u>Pork - the Nutrition Connection</u> undated, Ontario Pork Producers' Marketing Board</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm: Corn and Hog Farming</u> USDA, 1980 very U.S. in content</p> <p><u>African Swine Fever</u> 1979, Agriculture Canada</p> <p><u>Recommended code of practice for care and handling of pigs</u> 1984, Agriculture Canada</p> <p><u>Swine Housing Facilities</u> 1985, Alberta Agriculture</p> <p><u>Pork</u> 1975, Canadian Pork Council, 75 Albert Street Suite 1101 Ottawa, Ontario K1P 1E7</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Gardening on the Prairies</u> Roger Vick, Western Producer Prairie Books, 1987</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>University of Alberta Home Gardening Course</u> T. Shaw (Ed) University of Alberta, 1986</p> <p><u>Home Vegetable Growing</u> 1959, Agriculture Canada</p> <p><u>Growing Garden Potatoes</u> 1980, Agriculture Canada</p> <p><u>Composting</u> 1979, Agriculture Canada</p> <p><u>Home Vegetable Gardening in Alberta</u> 1983, Alberta Agriculture</p> <p><u>Alberta Vegetable Production Guide 1987-88</u> 1987, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>The Horse, an Alberta Heritage</u> undated, Alberta Agriculture</p> <p><u>Horse Management: Health</u> 1986, Alberta Agriculture</p> <p><u>Horse Management: Feeding</u> 1986, Alberta Agriculture</p> <p><u>Horse Management: Reproduction</u> 1986, Alberta Agriculture</p>

STUDENT: ACTIVITIES INCLUDED	STUDENT: REFERENCE ONLY
TEACHER: ACTIVITIES INCLUDED	TEACHER: REFERENCE ONLY

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Gardening on the Prairies</u> Roger Vick, Western Producer Prairie Books, 1987</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>University of Alberta Home Gardening Course,</u> T. Shaw (Ed) University of Alberta, 1986</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Irrigation in Alberta</u> 1985, Alberta Agriculture</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Alberta Irrigation Management Course</u> Alberta Agriculture, Home Study Program (\$30 - lessons)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Irrigation on the Prairies</u> 1975, Agriculture Canada</p> <p><u>Scheduling Irrigation to Meet Crop Demands</u> 1976, Agriculture Canada</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Gardening on the Prairie</u> Roger Vlck, Western Producer Prairie Books, 1987</p> <p><u>Your Shelterbelt Trees</u> undated, Alberta Agriculture</p> <p><u>Planting Farm, Field and Roadside Shelterbelts in Alberta</u> undated, Alberta Agriculture</p> <p><u>Planting Trees and Shrubs</u> 1980, Agriculture Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>University of Alberta Home Gardening Course</u> T. Shaw (Ed) University of Alberta, 1986</p> <p><u>Alberta Horticultural Guide</u> 1986, Alberta Agriculture</p> <p><u>Landscaping Alberta Yards</u> 1985, Alberta Agriculture</p> <p><u>Pruning in Alberta</u> 1987, Alberta Agriculture</p> <p><u>Chemical Weed Control in Shelterbelts</u> 1978, Agriculture Canada</p> <p><u>Snow and Wind Control for Farmstead and Feedlot</u> 1978, Agriculture Canada</p> <p><u>Transplanting Alberta Trees and Shrubs</u> 1985, Alberta Agriculture</p> <p><u>Shelterbelt Planting and Farmstead Beautification</u> 1983, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Alberta's Food Products</u> 1985, Alberta Agriculture</p>

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TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Grain and Oilseed Marketing Manuals – (Booklets 1-6)</u> 1984, Alberta Agriculture</p> <p><u>To Market, to Market</u> undated, Ontario Ministry of Agriculture and Food teacher's guide for using a videotape made for Junior High viewing</p>	<p>TEACHER: REFERENCE ONLY</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Canola: Alberta's leading vegetable oil</u> Alberta Agriculture limited nutritional and processing information included; mainly recipes</p> <p><u>Irrigated Canola Production</u> 1986, Alberta Agriculture</p> <p><u>Canola Meal in Poultry, Swine and Runimant Rations</u> 1982, Alberta Agriculture</p> <p><u>Canola Production in Alberta</u> 1985, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Cope . . . with a spending plan</u> 1983, Alberta Agriculture</p> <p><u>Cope . . . with family financial records</u> 1986, Alberta Agriculture</p> <p><u>Cope . . . with a household inventory</u> 1980, Alberta Agriculture</p> <p><u>Cope . . . with family and financial papers</u> 1983, Alberta Agriculture</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Farm Estate Planning Course</u> Alberta Agriculture, Home Study Program (\$30 - lessons)</p> <p><u>Making Your Money Work for You – Investments</u> 1983, Alberta Agriculture</p>	<p>TEACHER: REFERENCE ONLY</p> <p>A <u>Financial Security and the Farm Family</u> 1985, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Managing a Small Duck Flock</u> 1977, Agriculture Canada</p> <p><u>Raising Geese</u> 1980, Agriculture Canada</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Get Cracking with Eggs</u> (Teacher's Guide 1985) Alberta Egg Marketing Board 15, 1915 - 32 Avenue N.E. Calgary, Alberta T2E 7C8 (\$10.00/binder)</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>People on the Farm: Broiler Growers</u> USDA, 1980 very U.S. in content</p> <p><u>Poultry Production in Alberta</u> 1978, Alberta Agriculture</p> <p><u>Broiler Raising</u> 1978, Alberta Agriculture</p> <p><u>Poultry Housing Facilities</u> 1987, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p> <p><u>Food and Energy</u> 1986, Ontario Ministry of Agriculture and Food n.b. Section 4, Food Processing</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Home Curing</u> 1978, Alberta Agriculture</p> <p><u>Smoking Foods at Home</u> 1982, Alberta Agriculture</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Food Drying: a beginner's guide</u> 1985, Alberta Agriculture</p> <p><u>Freezing Foods</u> 1985, Alberta Agriculture</p> <p><u>Pickles and Relishes</u> 1984, Alberta Agriculture</p> <p><u>Jams, Jellies and Other Preserves</u> 1984, Alberta Agriculture</p> <p><u>Canning Canadian Fruits and Vegetables</u> 1984, Alberta Agriculture</p> <p><u>Home Canning of Meat and Poultry</u> 1983, Alberta Agriculture</p> <p><u>Food Storage in the Home</u> 1979, Agriculture Canada (a poster)</p> <p><u>Buying and Storing Canadian Foods for food service industry</u> 1980, Agriculture Canada</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p>Murphy, Wendy B. 1984, <u>The Future World of Agriculture</u>, Walt Disney Productions</p> <p><u>Research Report</u>, Alberta Agriculture Research Division – published monthly, newsletter reviewing agriculture research</p>
<p>TEACHER: ACTIVITIES INCLUDED</p> <p><u>Visions of the Future</u> undated, Ontario Ministry of Agriculture and Food</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Research Report</u> – Alberta Agriculture, Research Division, a monthly review of ongoing agriculture research in Alberta and the rest of Canada; several topics covered each issue. (Some technical reports are available on request)</p> <p>Various final reports from research funded by Alberta Agriculture Research Division are available in the Agriculture Library.</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>Protein Machines: Converting Roughage to Human Food</u>, undated, U of Guelph</p> <p><u>Alberta Sheep</u> 1985, Alberta Agriculture</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Artificial Rearing of Young Lambs</u> 9182, Alberta Agriculture</p> <p><u>Wool and Sheepskins</u> 1978, Alberta Agriculture</p>

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p> <p><u>The Story of Sugar</u>, undated, Canadian Sugar Institute 141 Adelaide Street West Suite 1101 Toronto, Ontario M5H 3L5</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>The Canadian Sugar Industry</u>, a basic study, 1981, Canadian Sugar Institute, address above</p>

STUDENT: ACTIVITIES INCLUDED

STUDENT: REFERENCE ONLY

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

Traffic Laws for Farm Vehicles and Implements
1986, Alberta Agriculture

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Trapping and Conservation Manual</u>, 1986 AVC Lac La Biche/Alberta Advanced Education/Alberta Forestry Lands and Wildlife Individual teacher copies may be requested from Mr. F. Neuman Trapper Services Coordinator Fish and Wildlife Division First Floor North Tower 9945 – 108 Street Edmonton, Alberta T5K 2G6 (phone 427-6750)</p>

STUDENT: ACTIVITIES INCLUDED

STUDENT: REFERENCE ONLY

TEACHER: ACTIVITIES INCLUDED

TEACHER: REFERENCE ONLY

Transplanting Alberta Shrubs and Trees
1985, Alberta Agriculture

Propagation and Production of Woody
Ornamentals in a Small Nursery
1980, Alberta Agriculture

<p>STUDENT: ACTIVITIES INCLUDED</p>	<p>STUDENT: REFERENCE ONLY</p>
<p>TEACHER: ACTIVITIES INCLUDED</p>	<p>TEACHER: REFERENCE ONLY</p> <p><u>Effects of Hail and Drought on Major Crops in Alberta,</u> 1986, Alberta Agriculture</p> <p><u>Growing Degree-Days and Crop Production in Canada</u> 1977, Agriculture Canada</p> <p><u>Snow and Wind Control for Farmstead and Feedlot</u> 1978, Agriculture Canada</p> <p><u>Potential for Weather Modification in Alberta</u> 1986, Alberta Agriculture</p> <p><u>Weather modification in Alberta, Research and Operations 1980-1985, Summary report and recommendations</u> 1986, Alberta Agriculture</p> <p><u>University of Alberta Home Gardening Course,</u> T. Shaw (Ed) University of Alberta, 1986</p>

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